REMARKS

Applicants and the undersigned are most grateful for the time and effort accorded the instant application by the Examiner. The Office is respectfully requested to reconsider the rejections presented in the outstanding Office Action in light of the following remarks.

Claims 1-25 were pending in the instant application at the time of the outstanding Office Action. Of these claims, Claims 1, 13 and 25 are independent claims; the remaining claims are dependent claims. Claims 1, 13, and 25 have been rewritten. Applicants intend no change in the scope of the claims by the changes made by this amendment. It should be noted this amendment is not in acquiescence of the Office's position on the allowability of the claims, but merely to expedite prosecution.

Claims 1-10, 13-22 and 25 are rejected under 35 U.S.C. § 101 as being directed towards non-statutory subject matter. Before entering into discussion concerning this rejection, it should be duly noted that the Office Action contains a typographical error, asserting that "Claims 1, 13, and 15 define non-statutory processes..." (Page 2, line 9) This assertion has been interpreted as regarding the independent claims 1, 13, and 25. If this interpretation is improper, further clarification is respectfully requested.

The Office asserts that the independent claims (and thus the depending claims) simply manipulate an arrangement of data without having any claimed limitations to a practical application. Specifically, the Office asserts that the present invention does not disclose any specific input. The independent claims have been amended to address this

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issue. Namely, independent claims 1, 13, and 25 have been amended to recite, *inter alia*,

"[p]roviding statistical parsing of speech and/or linguistic data...". Thus the statistical

parser input is not an abstraction, but rather, broadly speaking, comprises natural

language sentences. These sentences refer to a linguistic unit of human language, which

is specific and patentable under 35 U.S.C. § 101. Therefore, reconsideration and

withdrawal of the rejection is respectfully requested.

Claims 1, 13, and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated

by Richardson et al. (hereinafter "Richardson"). Claims 2, 5-12, 14, and 17-24 stand

rejected under 35 U.S.C. § 103(a) as being unpatentable over Richardson in view of Kita

et al. (hereinafter "Kita"). Claims 3, 4, 15, and 16 stand rejected under 35 U.S.C. §

103(a) as being unpatentable over Richardson in view of Kita, and further in view of

Miller et al. (hereinafter "Miller"). In light of the following remarks, reconsideration and

withdrawal of the present rejections is hereby respectfully requested. It should also be

noted, the comments made regarding the present invention in Applicants' previous

Amendment, dated June 27, 2005, remain equally applicable and are, therefore,

incorporated by reference as if fully set forth herein.

As indicated in Applicants' disclosure, when test data for a parser is different in

nature than the data on which the parser was trained, the performance of a parser will

become worse than that of a matched condition. The present invention thus broadly

contemplates adapting statistical parsers to new data. In particular, it is assumed that an

initial statistical parser is available and a batch of new data is given. In unsupervised

adaptation, however, true parses of the new data are not available. The initial model

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preferably includes a finite collection of probability mass functions (pmf's). The pmf's

are preferably transformed into a new model via Markov matrices. These Markov

matrices are preferably obtained by maximizing the likelihood of test data with respect to

the decoded parses using the initial model. The adaptation scheme may also be carried

out iteratively. (See Page 3, line 15 - Page 4, line 7) The instantly claimed invention thus

requires specifically "**adapting the statistical [parsing] model** via employing a

mathematical transform". (Claim 1, emphasis added) Similar language appears in the

other independent claims. In broad terms, the present invention relates to the adapting of

an existing statistical parser into one that fits better new or unseen text data.

As best understood, in contrast to the present invention, Richardson appears to be

directed to a method and apparatus for bootstrapping statistical processing into a rule-

based natural language processor. This bootstrapping optimizes the operating of a parse

that uses lexicon entries to determine possible parts of speech of words and a set of rules

to combine words from the input string into syntactic structures. (Abstract) Richardson

operates in three modes: a statistics compilation mode, a parsing mode, and a hybrid

mode. In the statistics compilation mode, Richardson applies each lexicon entry and rule

while parsing a last sample of representative text. Then statistics are compiled based on

the success rate of the rules and lexicon entries, either by storing the number of times the

rule or lexicon entry produced an entry in a parse tree or by storing a ratio of the number

of times an entry was produced to the number of applications of the rule or lexicon entry.

These statistics are normalized (put into the same format) so that they can be compared

from rule to rule or entry to entry. The parsing mode applies the rules and lexicon entries

until a single syntax tree is formed for the input, thereby not applying all applicable rules and entries as in the statistical compilation mode. The hybrid mode uses the first set of statistics to optimize the operation of the parser while compiling a second set of statistics. (column 4, lines 15-45; column 7, lines 5-25)

In the most recent Office Action the Examiner asserted that adapting the statistical model via employing a mathematical transform was met by "normalizing the statistics for the rules and lexicon entries (Fig. 1, element 103), where it would be necessary for the normalizing step to be carried out by a mathematical transform)". (Page 4, lines 5-8) The first striking and fundamental difference between the cited reference and the present invention is the central use of "rules and lexicon" in Richardson. There is simply no rule in the statistical parsers on which this invention was developed. Moreover, Applicants respectfully disagree with the Examiner's interpretation of Richardson to the extent that the Examiner indicates, "normalizing the statistics for the rules and lexicon entries, (Fig 1, element 103), where it would be necessary for the normalizing step to be carried out by a mathematical transform" is preformed by Richardson and/or teaches or suggests the present invention's "adapting a statistical model via employing a mathematical transform." (Id.) Generally speaking, the mathematical transform used in the present invention is not an arbitrary mathematical operation, but rather it must maintain the consistency of a probability distribution, i.e., there is a probability distribution before and after transform. There is simply no teaching or suggestion in Richardson that the normalization of the statistics is necessarily carried out by a mathematical transform. Further, any transform in Richardson is not an adaptation of the model to better fit new

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data, it is just a technique used so that the various entries of the model can be compared. As stated in Richardson, "the facility normalizes the compiled statistics, if necessary, so that the statistics for each rule may be compared to the statistic for each other rule and each lexicon entry." (column 4, lines 29-33) Therefore, the normalization step in Richardson has no connection to the present invention. It is thus respectfully submitted that Richardson falls short of the present invention.

Applicants respectfully submit that the applied art does not anticipate the present invention because, at the very least, "[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under construction." W.L. Gore & Associates, Inc. v. Garlock, 721 F.2d 1540, 1554 (Fed. Cir. 1983); see also In re Marshall, 198 U.S.P.Q. 344, 346 (C.C.P.A. 1978).

The Office also rejected certain claims under 35 U.S.C. § 103(a) over Richardson in combination with various references, asserting "it would have been obvious ... to combine the parsing system of Richardson et al. with the Markov calculations as taught by Kita et al." and "it would have been obvious ... [to] combine the parsing system of Richardson et al. with the Markov calculations as taught by Kita et al. and with the probability mass functions of Miller et al.". Applicants respectfully traverse these rejections.

Kita in combination with Richardson does not overcome the deficiencies of Richardson as discussed above. Neither Richardson nor Kita suggest "adapting the statistic parsing model via employing a mathematical transform". (Claim 1, and other

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independent claims) A 35 U.S.C. § 103(a) rejection requires that the combined cited

references provide both the motivation to combine the references and an expectation of

success. Further, such a rejection requires that the two combined references are

technically combinable. That is, the combination of the two references is technically and

practically possible and could be carried out by one of ordinary skill in the art. However,

the Richardson and Kita references are not technically combinable. The combination of

the two references would not be a valid working invention and thus have absolutely no

expectation of success.

More importantly, however, neither Kita nor Richardson address improving an

existing statistical parser when applied to newly acquired data by mathematically

transforming the existing model. The present invention does not involve Hidden Markov

Models (HMM), instead it uses a Markov transform, which is not an equivalent. HMMs

have an underlying Markov chain with probability functions associated with either states

or transitions. Since HMMs are not used in the present invention the algorithm

estimating or updating HMM parameters in Kita doses not apply to the present invention.

Appreciating the fact that HMMs are distinctively different from the present

mathematical transform, it is clear the rejections using this reference are without support

and should be withdrawn.

Additionally, the Applicant would like to make several other points regarding the

present rejections. With regard to claims 2 and 14, as indicated above, the present

invention does not use nor claim to use HMMs. Therefore, Kita does not teach or suggest

these claims and their rejections should be withdrawn. With respect to the rejections of

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claims 5 and 17, Applicants would like to additionally note that while matrix or vector

multiplication is known, it is not known or obvious to one skilled in the art to use the

technique in adapting or changing a statistical parser using the mathematical transform of

this invention. Furthermore, neither Kita nor Miller teach or suggest to one skilled in the

art a technique for adapting a statistical parser to new data as presently contemplated and

claimed. Therefore, the rejections of these claims should also be withdrawn. Per the

rejections of claims 6 and 18, as indicated above, Kita, as best understood, uses a well-

known technique for estimating HMM parameters, while the present invention, in at least

one embodiment, is related to a novel technique for adapting an existing statistical parser

to new data. Regarding the rejections of claims 8, 11, 20, and 23, while Richardson

addresses decoding test material it fails to teach or suggest decoding for the purpose of

adapting an existing parser to new data and/or decoding within a method or process

comprising constructing an initial parser and then applying the proposed adaptation

technique. As to the rejection of claims 10 and 22, "an efficient parsing mode, where the

parser only applies applicable rule and lexicon entries" fails to relate to adapting an

existing model to new material. These rejections should now be withdrawn.

Miller et al. in combination with Richardson and Kita does not overcome the

deficiencies of Richardson or Kita as discussed above. Further, the combination of these

references is also not technically valid, as shown above with respect to Richardson and

Kita. A 35 U.S.C. § 103(a) rejection requires that the combined cited references provide

both the motivation to combine the references and an expectation of success. Therefore,

it is respectfully submitted that the rejections based upon the combination of Miller with

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Richardson and Kita are not valid rejections. Reconsideration and withdrawal is respectfully requested. The Applicants would like to also note that none of these references, including Miller, address the process of transforming an original probability mass function into another, since it must be understood that there are two (2) probability mass functions, one occurring before and one occurring after adaptation. Furthermore, whether the probability mass function is written as a row or column vector is secondary to the novelty of the use of a mathematical transform as presently included in the claims.

Finally, the Office takes Official Notice that "the concept and advantages for updating a Markov model by right multiplying a row vector by a Markov matrix ... are well-known and expected in the art". (Page 5, lines 9-12) This Notice is respectfully traversed. This concept and advantages regarding this concept are respectfully asserted to be novel and thus NOT well-known or expected in the art.
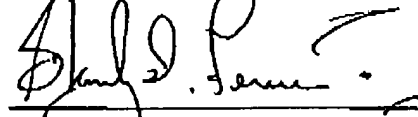
By virtue of dependence from what are believed to be allowable independent Claims 1 and 13, it is respectfully submitted that Claims 2-12 and 14-24 are also presently allowable.

The "prior art made of record" has been reviewed. Applicants acknowledge that such prior art was not deemed by the Office to be sufficiently relevant as to have been applied against the claims of the instant application. To the extent that the Office may apply such prior art against the claims in the future, Applicants will be fully prepared to respond thereto.

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In summary, it is respectfully submitted that the instant application, including

Claims 1-25, is presently in condition for allowance. Notice to the effect is earnestly

solicited. If there are any further issues in this application, the Examiner is invited to

contact the undersigned at the telephone number listed below.

Respectfully submitted,

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